Africa RISING Ghana Project ****

Summary of major achievements (2013 - 2014 Research Year)

**1 Research Output 1 (Situation Analysis)**

1.1 Multi-stakeholder partnerships were established for research prioritization and technology dissemination.

1.2 A mid-term review of the project was conducted.

1.3 Livestock feed markets were surveyed.

1.4 Livestock value chains were analyzed.

1.5 Farming systems were characterized.

1.6 A baseline survey was completed.

1.7 Aflatoxin prevalence in maize and groundnut was documented.

**2 Research Output 2 (Integrated systems improvement)**

2.1 The ‘Community-based Technology Park’ (CTP) approach was used to test and demonstrate improve crop varieties and agronomic management.

2.2 Fertilizer rates for intensive production of maize maturity types were defined.

2.3 Integrated pest management options for intensive cowpea production were identified.

2.4 Biological control of aflatoxins in maize and groundnut with Aflasafe Ghanaian product GH01 was initiated.

2.5 Feeding and health management options to intensify sheep and goat production were tested on-farm.

2.6 Management options to intensify rural poultry production were identified.

2.7 Nutritional knowledge of women in Africa RISING intervention areas was strengthened.

**3 Research Output 3 (Scaling and delivery systems)**

3.1 Community-based Technology Park approach was used to disseminate and/or demonstratetechnologiesto intensify the cropping systems**.**

3.2 Links were established with development partners and development projects for dissemination.

3.3 Farmers’ Field Days were organized to disseminate/demonstrate improved technologies.

**4 Research Output 4 (Monitoring and evaluation 4)**

4.1 Feed the Future (FtF) indicators for assessing the impact of the project were reported.

4.2 Projects reports were prepared and submitted to the donor.

4.3 A project document and a multi-year (2014-2016) work-plans were prepared.

**5 Research capacity building (cross-cutting)**

5.1 Short-courses were organized to build capacity for integrated crop-livestock research**.**

5.2 Fourteen graduate students were funded by the project.

**1 Background**

Africa RISING is a research-for-development project to provide pathways out of hunger and poverty for small holder farm families. To achieve this, the project strives to come up with options to sustainably intensify the existing farming systems which would allow farm families to improve food, nutrition and income security, and conserve the natural resource base.

The program is organized around four research outputs that are logically linked in time and space, namely:

1. Situation Analysis and Program-wide Synthesis (Output 1)

2. Integrated Systems Improvement (Output 2)

3. Scaling and Delivery of Integrated Innovation (Output 3)

4. Integrated Monitoring and Evaluation (Output 4)

In Ghana, Africa RISING is implemented in in 25 communities in the zones of influence of the US Government’s Feed the Future Initiative, namely Northern, Upper West and Upper East Regions. It operates through community and district level research-for-development (R4D) platforms to identify and implement activities to address the bio-physical and socio-economic constraints of the farming systems. The platforms consist of multi-disciplinary and multi-institutional research teams and development partners and policy makers that that facilitates stakeholder interaction and ownership, farmer experimentation and evaluation, sustainability, and effective delivery of improved technologies.

The activities are implemented mostly on-farm and on-station. The on-farm activities are managed by researchers, researchers and farmers, and farmers only. They are used to compare intensified practices with farmers’ practices, demonstrate new technologies and/or a combination of technologies through farmers’ field days, farmers’ field schools and exchange visits, and to train farmers, extension and research assistants. The on-station activities are mostly used by graduate students as part of their dissertation research to test and/or develop new technologies.

Building the capacity of from farmers, development workers, field and laboratory technicians, scientists and graduate (MSc and PhD) are key components of the project. Gender awareness and gender equity, youth and under-privileged groups within society are considered in all activities. Women interest groups (WIGs) are promoted to ensure effective participation of women.

The scale of operation ranges from the plot to farm/field scale or from household to the community level. Most of the activities are implemented at the plot or field levels. Nevertheless, results and outputs from the activities can be extrapolated to larger scales and bigger recommendation domains using modeling, Geographical Information Systems (GIS) and Remote Sensing techniques.

**2 Achievements**

Specific achievements under the research outputs are:

**2.1 Situation Analysis (Research Output 1)**

*2.1.1 Multi-stakeholder partnerships were established for research prioritization and technology dissemination.*Table 1 presents the list of partners. IITA and MoFA continued mobilizing communities. A workshop was organized on 18th June, 2014 at Wa to identify potential actors and their roles in community and district level R4D platforms. Key actors identified were: the Council for Scientific and Industrial Research, MoFA, rural banks, departments of cooperatives, service providers, chiefs or opinion leaders, makazie or queen, assemblymen, Ghana Health Services (GHS), Ghana Education Service (GES), community-based organizations, agricultural extension agents (AEAs), livestock officers, women’s interest groups, farmers’ interest groups and local radio station. Six R4D platforms were established in two districts in each of the three regions - Northern (Tolon and Savelugu), Upper East (Bongo and Kassena-Nankana) and Upper West ( Nadowli/Kaleo and Wa West).

*2.1.2 A mid-term review of the project was conducted.* A team of external evaluator reviewed the project in September and October 2014 and made recommendations related to research and management of the project. The recommendations are being addressed to ensure effective implementation and adoption of innovations to intensify the farming systems.

*2.1.3 Livestock feed markets were surveyed.*ILRI completed a survey of the livestock feed markets in the three regions. A paper on ‘Feed markets in Ghana’ was presented at the Ghana Animal Science Association (GASA) Biennial Conference in August at Tamale.

*2.1.4 Livestock value chains were analyzed.*Data collection, entry into computer and analysis on livestock value chains in northern Ghana was completed by ILRI. Two MSc students working on livestock value chains defended their dissertation research at the University of Ghana, Legon.

*2.1.5 Farming systems were characterized.* Wageningen University completed analysis of the farming systems at the intervention communities. Data was analyzed for construction of farm typologies. Constraints to, and entry points for intensification were identified.

*2.1.6 A baseline survey was completed.* IFPRI completed a baseline survey. Preliminary analysis of the data was completed.

*2.1.7 Aflatoxin prevalence in maize and groundnut was documented.* SARI completed surveys on prevalence of aflatoxin contamination in maize and groundnut in selected intervention communities in the three regions. A paper was drafted and submitted for publication in an international journal.

**2.2 Integrated systems improvement (Research Output 2)**

More than 150 farmer participatory research and demonstration trials were conducted to develop, test and/or adapt, demonstrate and disseminate combinations of improved varieties of cereals (maize, rice and sorghum), legumes (groundnut, cowpea, soybean and pigeon pea) and vegetables (okra, roselle, tomato, chilli pepper) with management practices (planting date, sowing densities, cereal-legume rotations and intercropping, integrated soil, weed and pest and disease management) for the sustainable intensification of the cropping systems to more than 3000 farmers. Key achievements included:

*2.2.1 The ‘Community-based Technology Park’ (CTP) approach was used to test and demonstrate improve crop varieties and agronomic management.* More than 150 farmer participatory research and demonstration trials were established in CTPs in the three regions. The CTP approach was used to evaluate and demonstrate new technologies, provide hands-on training for farmers, facilitate knowledge flow among farmers, train undergraduate and graduate students, and to determine farmer preferences for technologies.

*2.2.2 Fertilizer rates for intensive production of maize maturity types were defined.* Government recommended fertilizer rate for maize - NPK (15-15-15) compound fertilizer at 250 kg/ha + top dressing sulphate of ammonia at 125 kg/ha (64-38-38 kg/ha) – was compared with a higher fertilizer rate: NPK (15-15-15) compound fertilizer at 250 kg/ha + top dressing sulphate of ammonia at 250 kg/ha (91-38-38 kg/ha) for intensive maize production. Three maize maturity types were used - extra-early (80-85 day: Abontem and TZEE W STR QPM CO), early (85-100 days: Abrohema and Omankwa) and medium (100-110 days: Obatanpa and DT SR W CO F2) in five communities in each of the three regions. Averaged across maize types, the higher fertilizer rate increased grain yield by 6, 19 and 150 percent in the Upper West, Northern and Upper East regions. Promising extra-early, early and medium maturing types were TZEE W STR QPM CO, Omankwa and DT SR W CO F2 respectively.

*2.2.3 Integrated pest management options for intensive cowpea production were identified.* Evaluation of the effect of spraying insecticide once or thrice on grain yields of six cowpea varieties: Songotra and Apagbala (early-maturing and erect), Padituya and IT 99K-573-1-1 (medium-maturing and semi-erect), Zaayura (medium-maturing and erect) and farmers’ variety (late-maturing and prostrate) was completed. The spraying regime rate x cowpea variety interaction was not significant in all regions. Spraying cowpea three times during the growing season significantly increased grain yields. Cowpea varieties were Apagbala, Zaayura, IT 99K-573-1-1, Padituya and Songotra were the most promising.

*2.2.4 Biological control of aflatoxins in maize and groundnut with Aflasafe Ghanaian product GH01 was initiated.* Stakeholder workshops were held in three regions to raise awareness about the dangers of aflatoxin exposure and to train farmers and extension officials on aflatoxin mitigation. A total of 129 farmers and AEAs were trained.

A total of 1.08 tons of aflasafe Ghana composed of 360 kg of three products: A (GHM174-1, GHG331-8, GHGo79-4 GHM109); B (GHM173-6, GHG083-4, GHM287-10 GHG183-7); and C (GHM017-6, GHM552-3, GHG321-2 GHM001-5) were produced and evaluated on 30 maize and 30 groundnut fields for their ability to reduce aflatoxin.

*2.2.5 Feeding and health management options to intensify sheep and goat production were tested on-farm.* An on-farm trial led by the International Livestock Research Institute in partnership with the Animal Research Institute continued in all the regions. Preliminary results showed that a combination of feeding and health improved productivity of sheep and goats under village conditions.

*2.2.6 Management options to intensify rural poultry production were identified.* An on-farm trial led by the Animal Science Department of the University for Development Studies showed that intensive management of chickens increased growth rates by more than 25% compared with the extensive management systems practiced by farmers.

*2.2.7 Nutritional knowledge of women in Africa RISING intervention areas was strengthened:* The Ghana Health Service in collaboration with the Community Nutrition Department of the University for Development Studies trained 40 community health workers, including members of women’s groups in the intervention communities in the Savelugu and Nadowli districts on Infant and Young Child Feeding practices.

**2.3 Scaling and delivery systems (Research Output 3)**

*2.3.1 Community-based Technology Park approach was used to disseminate and/or demonstrate**technologies**to intensify the cropping systems***.** A total of 817 and 559 farmers established ‘Baby’ and ‘Scaling-up’ trials respectively during the cropping season. The ‘baby’ trials were used by farmers to compare component technologies from ‘Mother’ trials in the CTP with their practices under the leadership of Agricultural Extension Officers (AEAs) from MOFA. In addition, farmer-managed large demonstration plots were established to scaling-up proven cereal-legume technologies, including cereal-legume rotation, cereal-legume strip cropping and cereal-legume inter-cropping.

*2.3.2 Links were established with development partners and development projects for dissemination.* An MOU was signed between the Africa RISING and the Agricultural Technology Transfer project to disseminate integrated soil fertility management options.

*2.3.3 Farmers’ Field Days were organized to disseminate/demonstrate improved technologies.*Community-level field days were organized in the 25 communities to demonstrate and disseminate improved technologies to more than 2000 farmers.

**2.4 Monitoring and evaluation (Research Output 4)**

*2.4.1 Feed the Future (FtF) indicators for assessing the impact of the project were reported.* A reported on the eight FtF indicators was submitted to USAID for an assessment of the impact of the project, and contributed to discussions on identifying suitable and sustainable intensification indicators.

*2.4.2 Projects reports were prepared and submitted to the donor.* Interim and annual technical reports on project activities were written and submitted to the donor.

*2.4.3 A project document and a multi-year (2014-2016) work-plans were prepared.* After having had only annual work plans in the first two years of the project, a research plan for the period 2014-2016 was developed. Also, a project specific document describing the research in Ghana and Mali has been drafted.

**2.5 Research capacity building**

*2.5.1 Short-courses were organized to build capacity for integrated crop-livestock research***.** Two short-term courses were organized for early career research scientists. The first on ‘Integrated Crop-Livestock Systems’ was attended by 15 participants (3 female and 12 male). The second course on ‘*Statistics and Statistical Computing Using SAS Software’* had 17 participants (8 female and 9 male).

*2.5.2 Fourteen graduate students were funded by the project.* Graduate students (5 PhD and 9 MSc) were attached to the project to undertake their dissertation research.